FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Total Metals By EPA Method 200.8

Client ID:	M05048A Lg Tank	Client:	Alaskan Copper Works
Date Received:	01/07/10	Project:	PO M05048, F&BI 001035
Date Extracted:	01/08/10	Lab ID:	001035-01 x10,000
Date Analyzed:	01/11/10	Data File:	001035-01 x10,000.066
Matrix:	Aqueous	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	96	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	14,300,000
Nickel	14,300,000
Copper	2,070,000
Zinc	65,800
Iron Screen	1,400,000

AKC-0005084

Analysis For Total Metals By EPA Method 200.8

Client ID:	M05048B Sm Tank	Client:	Alaskan Copper Works
Date Received:	01/07/10	Project:	PO M05048, F&BI 001035
Date Extracted:	01/08/10	Lab ID:	001035-02 x10,000
Date Analyzed:	01/11/10	Data File:	001035-02 x10,000.067
Matrix:	Aqueous	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	92	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	5,430,000
Nickel	8,730,000
Copper	8,330,000
Zinc	29,500
Iron Screen	650,000

AKC-0005085

Analysis For Total Metals By EPA Method 200.8

Client ID:	Method Blank	Client:	Alaskan Copper Works
Date Received:	Not Applicable	Project:	PO M05048, F&BI 001035
Date Extracted:	01/08/10	Lab ID:	I0-0011 mb
Date Analyzed:	01/11/10	Data File:	I0-0011 mb.063
Matrix:	Aqueous	Instrument:	ICPMS1
Units:	ug/L (ppb)	Operator:	AP

Internal Standard:	% Recovery:	Lower Limit:	Upper Limit:
Germanium	87	60	125

Analyte:	Concentration ug/L (ppb)
Chromium	<1
Nickel	<1
Copper	<1
Zinc	<1
Iron Screen	<250

AKC-0005086

Date of Report: 01/14/10
Date Received: 01/07/10
Project: % of Acid Test, PO M05048, F&BI 001035
Date Analyzed: 01/08/10

RESULTS FROM THE ANALYSIS OF AQUEOUS SAMPLES FOR SPECIFIC GRAVITY @ 15.56 °C

Sample ID Laboratory ID	Specific Gravity
M05048A Lg Tank 001035-01	1.23
M05048B Sm Tank 001035-02	1.19

AKC-0005087

Date of Report: 01/14/10
Date Received: 01/07/10
Project: % of Acid Test, PO M05048, F&BI 001035
Date Analyzed: 01/08/10

RESULTS FROM THE ANALYSIS OF AQUEOUS SAMPLES FOR PERCENT ACID

Sample ID Laboratory ID	Percent Acid
M05048A Lg Tank 001035-01	8.9
M05048B Sm Tank 001035-02	8.0

AKC-0005088

Date of Report: 01/14/10
Date Received: 01/07/10
Project: % of Acid Test, PO M05048, F&BI 001035

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AQUEOUS SAMPLES FOR TOTAL METALS USING EPA METHOD 200.8

Laboratory Code: 001018-01 (Duplicate)

Analyte	Reporting Units	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Chromium	ug/L (ppb)	<1	1.83	nm	0-20
Nickel	ug/L (ppb)	4.25	4.42	4	0-20
Copper	ug/L (ppb)	<1	<1	nm	0-20
Zinc	ug/L (ppb)	1.94	1.82	6	0-20

Laboratory Code: 001018-01 (Matrix Spike)

Analyte	Reporting Units	Spike Level	Sample Result	Percent Recovery MS	Acceptance Criteria
Chromium	ug/L (ppb)	20	<1	110	50-150
Nickel	ug/L (ppb)	20	4.25	99 b	50-150
Copper	ug/L (ppb)	20	<1	102	50-150
Zinc	ug/L (ppb)	50	1.94	102	50-150

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Chromium	ug/L (ppb)	20	105	70-130
Nickel	ug/L (ppb)	20	103	70-130
Copper	ug/L (ppb)	20	100	70-130
Zinc	ug/L (ppb)	50	103	70-130

AKC-0005089

Date of Report: 01/14/10
Date Received: 01/07/10
Project: % of Acid Test, PO M05048, F&BI 001035

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF AQUEOUS SAMPLES FOR SPECIFIC GRAVITY @ 15.56 °C

Laboratory Code: 001035-02 (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Specific Gravity	1.19	1.19	nm	0-2

AKC-0005090

Date of Report: 01/14/10
Date Received: 01/07/10
Project: % of Acid Test, PO M05048, F&BI 001035

QUALITY ASSURANCE RESULTS FROM THE ANALYSIS OF AQUEOUS SAMPLES FOR PERCENT ACID

Laboratory Code: 001035-01 (Duplicate)

Analyte	Sample Result	Duplicate Result	Relative Percent Difference	Acceptance Criteria
Percent Acid	8.9	8.6	3	0-20

AKC-0005091

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

A1 – More than one compound of similar molecule structure was identified with equal probability.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for this range fell outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte indicated may be due to carryover from previous sample injections.

d - The sample was diluted. Detection limits may be raised due to dilution.

ds - The sample was diluted. Detection limits are raised due to dilution and surrogate recoveries may not be meaningful.

dv - Insufficient sample was available to achieve normal reporting limits and limits are raised accordingly.

fb - The analyte indicated was found in the method blank. The result should be considered an estimate.

fc – The compound is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. The variability is attributed to sample inhomogeneity.

ht - The sample was extracted outside of holding time. Results should be considered estimates.

ip - Recovery fell outside of normal control limits. Compounds in the sample matrix interfered with the quantitation of the analyte.

j – The result is below normal reporting limits. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The analyte result in the laboratory control sample is out of control limits. The reported concentration should be considered an estimate.

jr - The rpd result in laboratory control sample associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the compound indicated is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc – The sample was received in a container not approved by the method. The value reported should be considered an estimate.

pr – The sample was received with incorrect preservation. The value reported should be considered an estimate.

ve - The value reported exceeded the calibration range established for the analyte. The reported concentration should be considered an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The pattern of peaks present is not indicative of diesel.

y - The pattern of peaks present is not indicative of motor oil.

AKC-0005092

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

January 14, 2010

DUPLICATE

INVOICE #10ACU0114-2

Accounts Payable
Alaskan Copper Works
628 South Hanford
Seattle, WA 98134

RE: Project % of Acid Test, PO M05048, F&BI 001035 - Results of testing requested by Gerry Thompson for material submitted on January 7, 2010.

2 sample analyzed for Total Chromium, Copper, Nickel and Zinc by Method 200.8 @ $85 per sample	$ 170.00
2 samples analyzed for Specific Gravity @ $30 per sample	60.00
2 samples analyzed for Percent Acid Content @ $75 per sample	150.00
2 samples analyzed for Total Iron by Method 200.8 @ $40 per sample	80.00
Amount Due	$ 460.00

FEDERAL TAX ID (b) (6)

001035

SAMPLE CHAIN OF CUSTODY

ME 01/07/10 AI4

Page ____ of ____

Send Report To Gerald Thompson

Company Alaskan Copper Works

Address 3200 6th Ave S.

City, State, ZIP Seattle WA 98134

Phone # 206-571-6033 Fax # 206-382-4305

SAMPLERS (signature)

PROJECT NAME/NO.: % of Acid Test

PO #: M050 48

REMARKS

TURNAROUND TIME
- ☐ Standard (2 Weeks)
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Return samples
- ☐ Will call with instructions

Sample ID	Lab ID	Date	Time	Sample Type	# of containers	ANALYSES REQUESTED: TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260	SVOCs by 8270	HFS	% of HNO3	Spec. Grav.	Cr Cu	Ni Zn Fe		Notes
M050 48A	01	1/7/10	1:00	HNO3	1							X	X	X	X		
LG TANK																	
M050 48B	02	1/7/10	1:00	HNO3	1							X	X	X	X		
Sm. Tank																	

Friedman & Bruya, Inc.
3012 16th Avenue West
Seattle, WA 98119-2029
Ph. (206) 285-8282
Fax (206) 283-5044

FORMS\COC\COC.DOC

	SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by:		Gerald Thompson	Acw	1/7/10	2:20PM
Received by:		Khan Phan	FEBI	1/7/10	V
Relinquished by:					
Received by:					

Samples received at 20 °C

AKC-0005094

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Charlene Morrow, M.S.
Yelena Aravkina, M.S.
Bradley T. Benson, B.S.
Kurt Johnson, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
TEL: (206) 285-8282
FAX: (206) 283-5044
e-mail: fbi@isomedia.com

January 14, 2010

Gerry Thompson, Project Manager
Alaskan Copper Works
628 South Hanford
Seattle, WA 98134

Dear Mr. Thompson:

Included are the results from the testing of material submitted on January 7, 2010 from the % of Acid Test, PO M05048, F&BI 001035 project. There are 9 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
ACU0114R.DOC